NASA SBIR/STTR Technologies

Title: PHASE 2: An Integrated Human System Interaction (HSI) Framework for Human-Autonomy Component Team Collaboration

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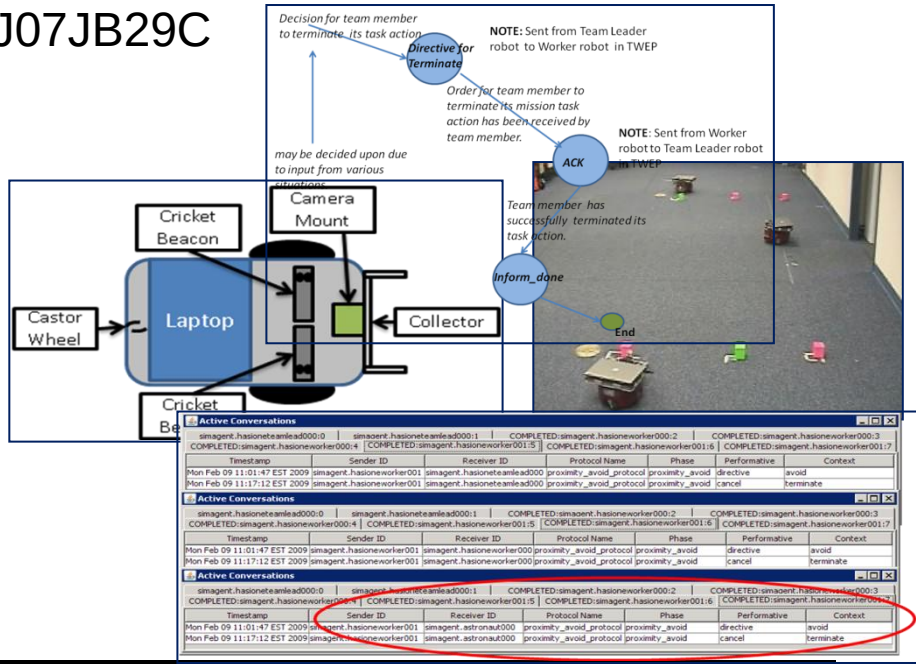
Innovation: Development of a novel, protocol-based Astronaut-robot interaction framework (HASI). The HASI role-based Team Work Effort protocol supports autonomous robots in a mission, with allowance for Astronaut oversight. Ancillary protocols provide for mission situational awareness, including protocols for problem reporting, safety, recharging. HASI protocols are suitable for utilization in robots whose robot operating system (ROS) is protocol –aware, the ROS must also support the notion of a 'Robot agent'.
Significance: With HASI, an Astronaut can provide oversight to an autonomous robot team engaged in mission activity . **TRL: 3-4**



Technical Objective and Work Plan: The primary technical objective is to develop the HASI protocols and to upgrade a robot operating system (ROS) to be protocol –aware. The Work Plan is: (1) protocol design and implementation, (2) modification of the Distributed Control System ROS to be protocol –aware and cognitively enhanced, (3) notional Scientific Sampling Mission design, (4) simulation testing of protocol use on Mission, (5) deployment to robot hardware for testing in the laboratory.

NASA and non-NASA Applications NASA applications of HASI include Space Exploration Missions, including the Lunar Outpost and Scientific Sampling Missions . Non-NASA applicability of HASI include warehouse operations, search and rescue and manufacturing automation that involves the use of mobile robots.

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